## AMENDMENTS TO THE DRAWINGS

New Fig. 2 has been added. The figure schematically shows adjacent balls having a spacer disposed therebetween. This arrangement was described in the specification as originally filed at, for example, page 3, last two paragraphs, and in claims 2, 4, 6, and 8. No new matter has been added.

Attachment: One Replacement Sheet of Drawings (including New Fig. 2)

## REMARKS

Claims 2, 4, 6, and 8, are all the claims pending in the application. Previously claims 1, 3, 5, and 7 were canceled without prejudice or disclaimer. Reconsideration and allowance of all the claims are respectfully requested in view of the following remarks.

### Specification

The Examiner objected to the abstract of the disclosure because of informalities. Applicants have amended the abstract in a manner believed to remove the informalities.

### Drawings

The Examiner objected to the drawings as not showing "spacers" as set forth in the claims. Accordingly, Applicants have submitted herewith a replacement drawing sheet, wherein Fig. 2 has newly been added to schematically show a spacer between adjacent balls. This arrangement is described in the specification as originally filed at page 3, last 2 paragraphs, and in claims 2, 4, 6, and 8, for example. No new matter has been entered.

Page 4 of the specification has been amended to reference the new Fig. 2.

### Claim Rejections - 35 U.S.C. § 112

The Examiner rejected claims 2, 4, 6, and 8, under §112, 2nd paragraph as indefinite. Specifically, the Examiner asserted that it is unclear whether claim 2 sets forth a "spacer" as on line 9, or "spacers" as on line 13. Applicants have amended claim 2 to correct the inconsistency in use of terms.

### Claim Rejections - 35 U.S.C. § 102

- The Examiner rejected claims 2, 4, and 6, under §102(b) as being anticipated by US Patent 6,149,307 to Kamimura et al. (hereinafter Kamimura). Additionally, the Examiner rejected claims 2, 4, and 6, under §102(b) as being anticipated by US Patent 3,053,105 to Cole (hereinafter Cole). Applicants respectfully traverse these rejections because neither Kamimura nor Cole discloses every element as set forth in the claims.

Claim 2 sets forth a ball screw comprising: a screw shaft; a nut; and a number of balls disposed therebetween, and spacers between adjacent ones of the balls, wherein a variation of the total of gaps between the balls and spacers during the rolling of the balls is smaller than 1/20 of an outer diameter of the ball.

For example, similar to that shown in Fig. 1, one embodiment of the invention is a ball screw comprising: a screw shaft 2; a nut 3; and a number of balls 4 disposed therebetween, wherein a variation of the total of gaps (C) between the balls 4 and spacers (shown in Fig. 2) during the rolling of the balls is smaller than 1/20 of an outer diameter of the ball 4. The variation of the total gaps (C) is determined, for example, by calculating the total of gaps (C), moving the balls and spacers as by moving the nut 3 relative to the screw shaft 2, calculating the total of the gaps (C) again and a difference from the first calculated value, and then repeating.[1] By making the variation of the total of gaps (C) between the balls and spacers during the rolling of the balls smaller than 1/20 of an outer diameter of the ball, the ball screw is little subject to deterioration of operating characteristics and occurrence of wear, torque change, noise, vibration, etc. during operation due to stagnation or competition of balls.[2]

In contrast to that set forth in claim 2, each one of Kamimura and Cole discloses an arrangement wherein the total gaps between the balls is reduced to a minimum. For example, Kamimura discloses that the "separator 30 is used to **minimize**, preferably to eliminate the clearance between the adjoining balls 7 ..." See, for example, col. 8, lines 43-45 (emphasis added). Further, Kamimura discloses that there is "**substantially no clearance**" between the balls, and that "the lubricating rings may be **at least partially in contact** with any adjoining rolling elements ..." See col. 5, lines 44-49, and 61-63 (emphasis added).

Yet, reducing the gap is not the same as the reducing the variation of the gap. Even if the gaps are reduced as recited in Kamimura or Cole, the variation of the total amount of the gaps is not reduced as is directed by the presently claimed invention.

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[1] Specification at page 6, 2nd full paragraph.

[2] Specification at page 7, lines 11-19.

On the contrary, the presently claimed invention is directed not to the gaps between the balls and spacers themselves but to "the variation of the total of the gaps formed between the balls and the spacers during the rolling of the balls". See, for example, claim 2.

Again, this point is not disclosed in either one of Kamimura and Cole, and is not obvious therefrom. Even if the gaps between the balls are reduced, the variation of the total gaps between the balls and spacers is not necessarily reduced.

For at least any of the above reasons, each one of Kamimura and Cole fails to anticipate claim 2. Likewise, these references fail to anticipate dependent claims 4 and 6.

## Allowable Subject Matter

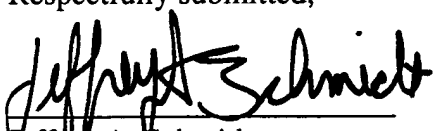
The Examiner did not apply any prior art rejections to claim 8. Accordingly, because the Examiner's rejection under §112 is believed to have been overcome, at least claim 8 should now be in condition for immediate allowance.

## Conclusion

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,



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